



**50 Years Later – The
Legacy of the 1964
Flood in the Redwood
Creek Watershed**

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Long-Term Legacy of the 1964 Flood

Landslide scars

Log jams

Floodplain deposits

Channel deposits

Near-shore deposits

Flood control levees/Bridges

Policy

REDW/Forest Practices

FEMA mapping

Climate – can we expect this to happen again?

Rainfall in Redwood Creek Basin

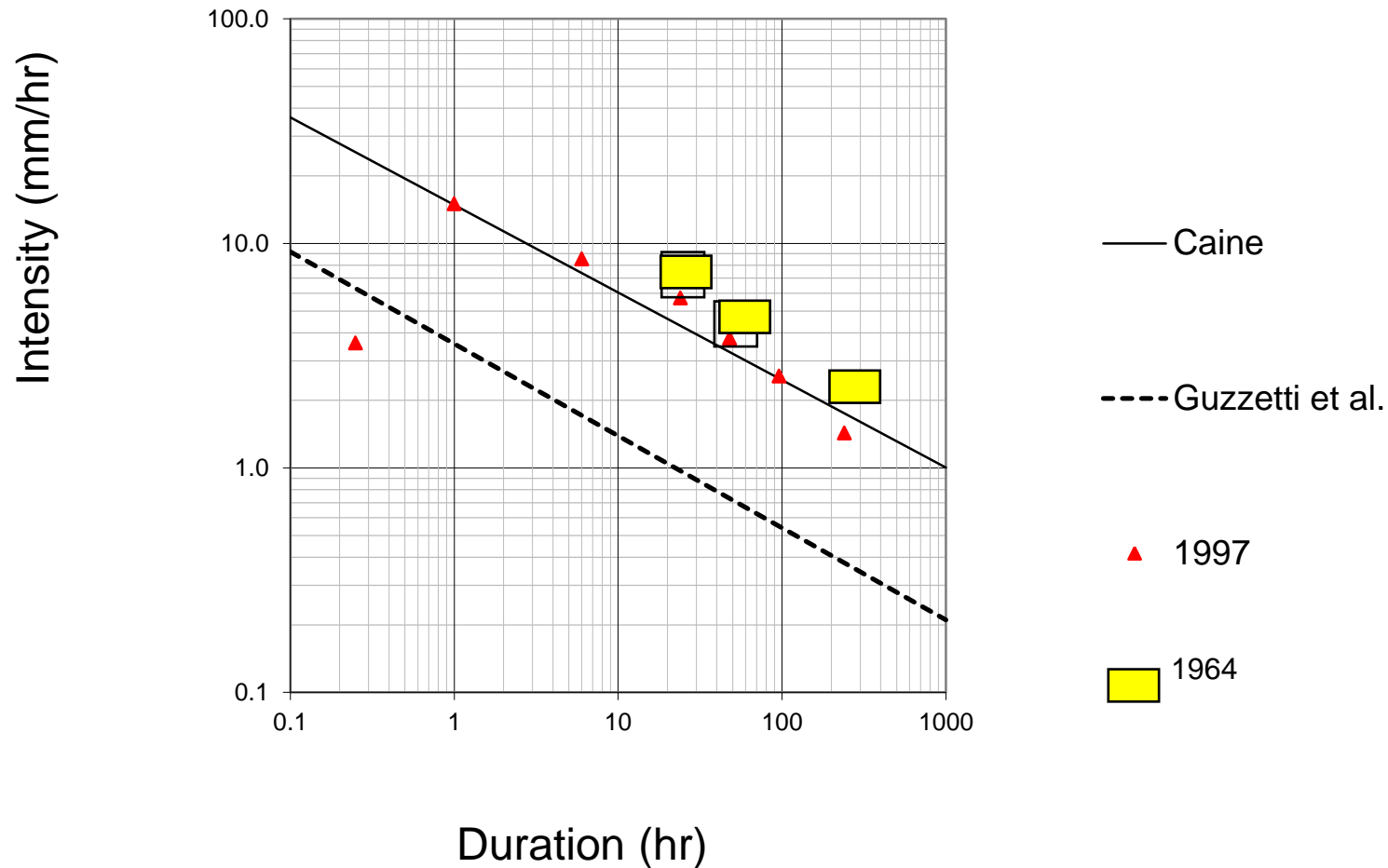
December 18-24, 1964


Orick: 264 mm (10.4 in)

Hoopla: 498 mm (19.6 in)

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Landslide Thresholds: Rainfall Duration-Intensity

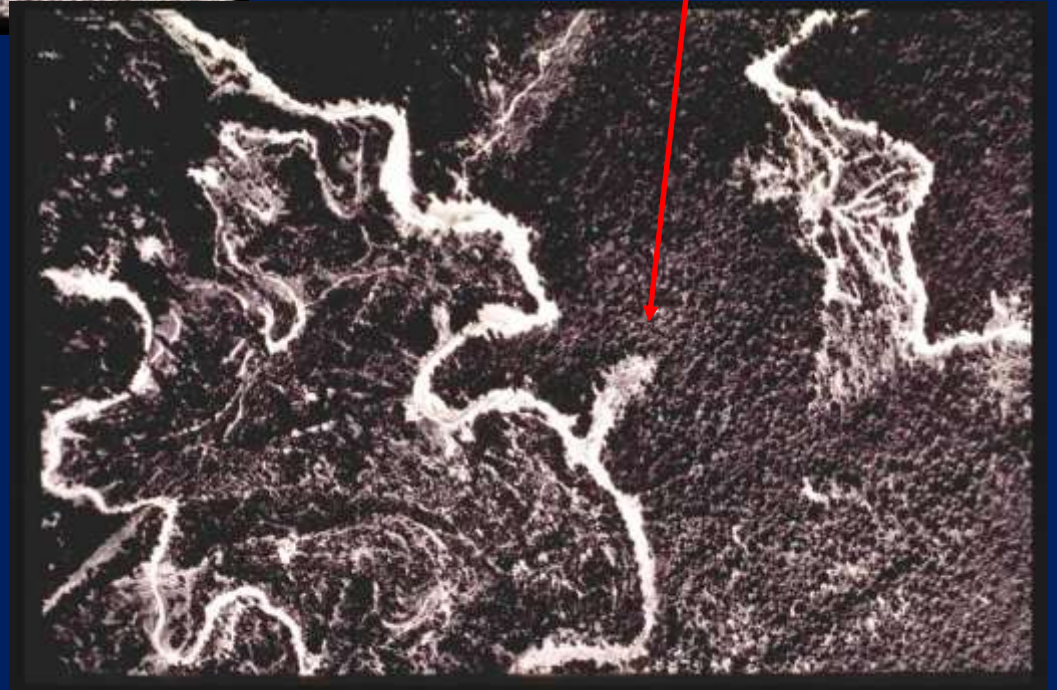


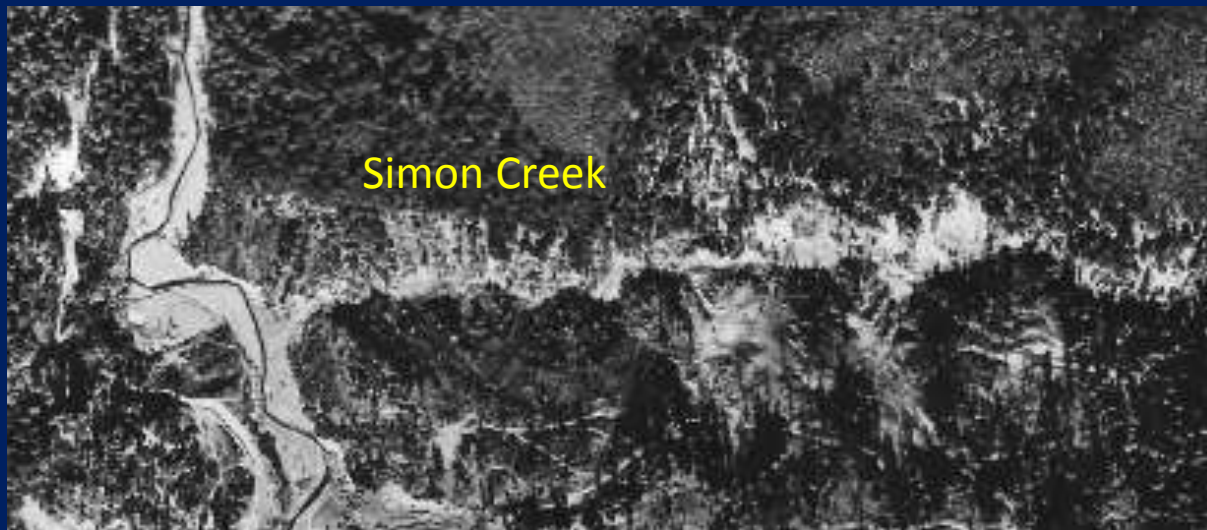


Landslides are a major contributor to sediment loads of rivers in north coastal California



Air photo mapping of
landslide scars





Simon Creek

1966



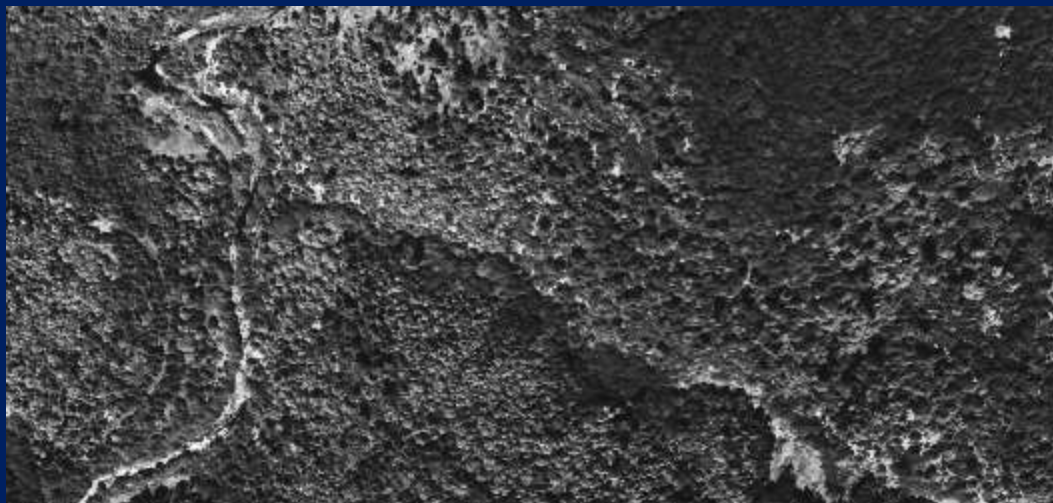
1978



1966



1978



1997



1966



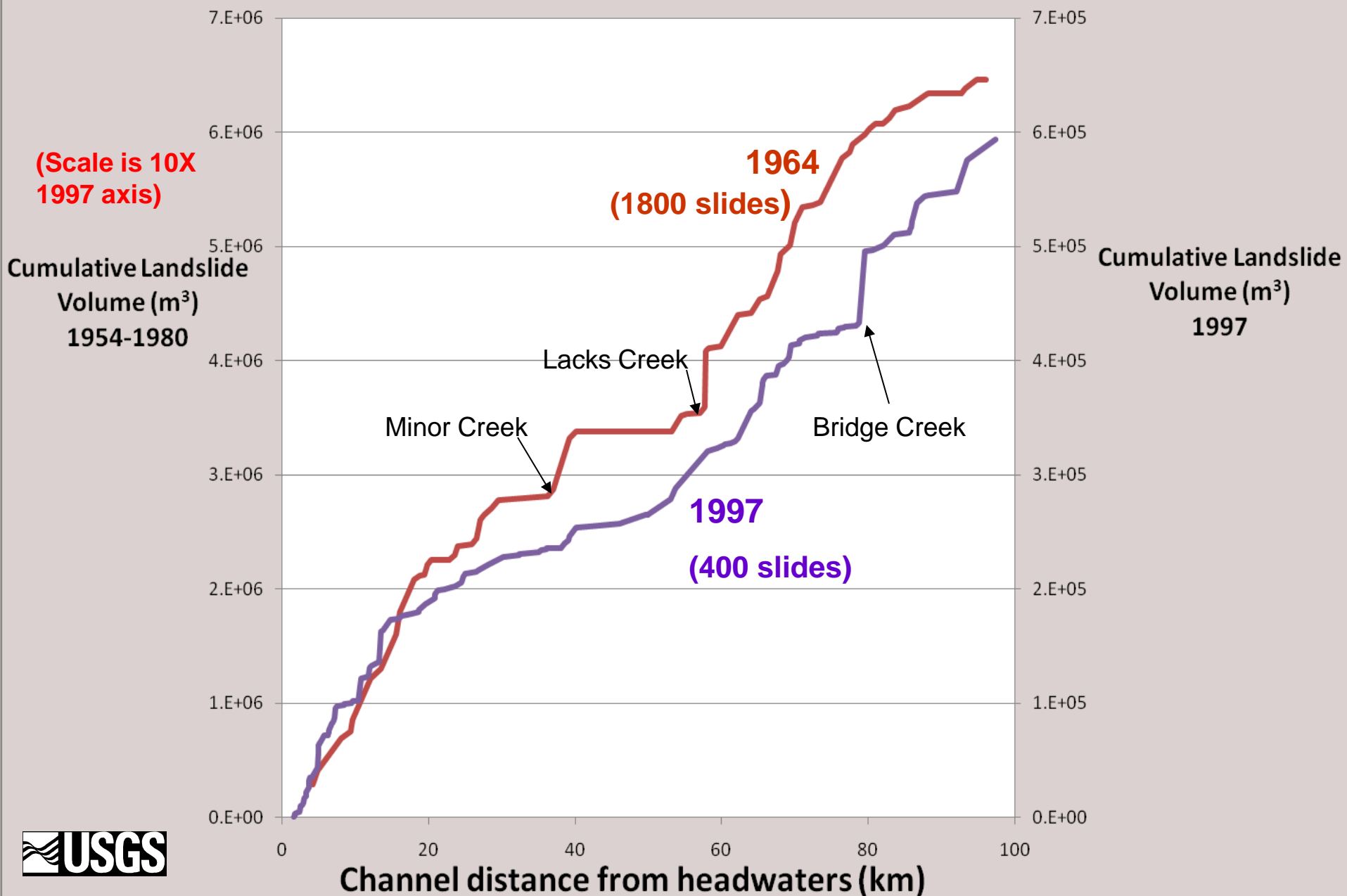
1978

Long-term loss
of soil
productivity



1997

Cumulative Landslide Volume vs. Channel Distance





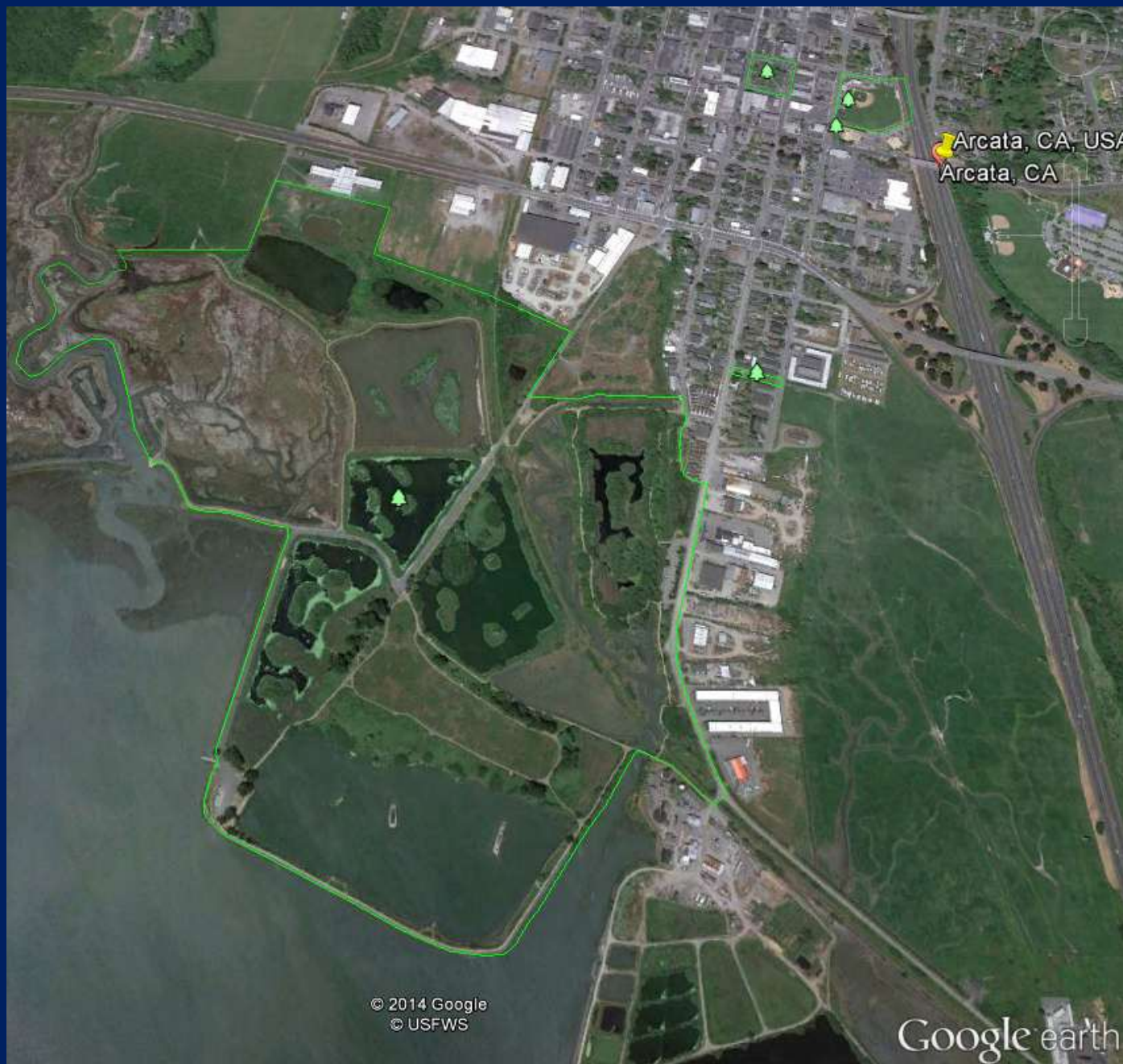
Arcata, Humboldt Co., California
Circa 1913

CV No. 97-060-0001



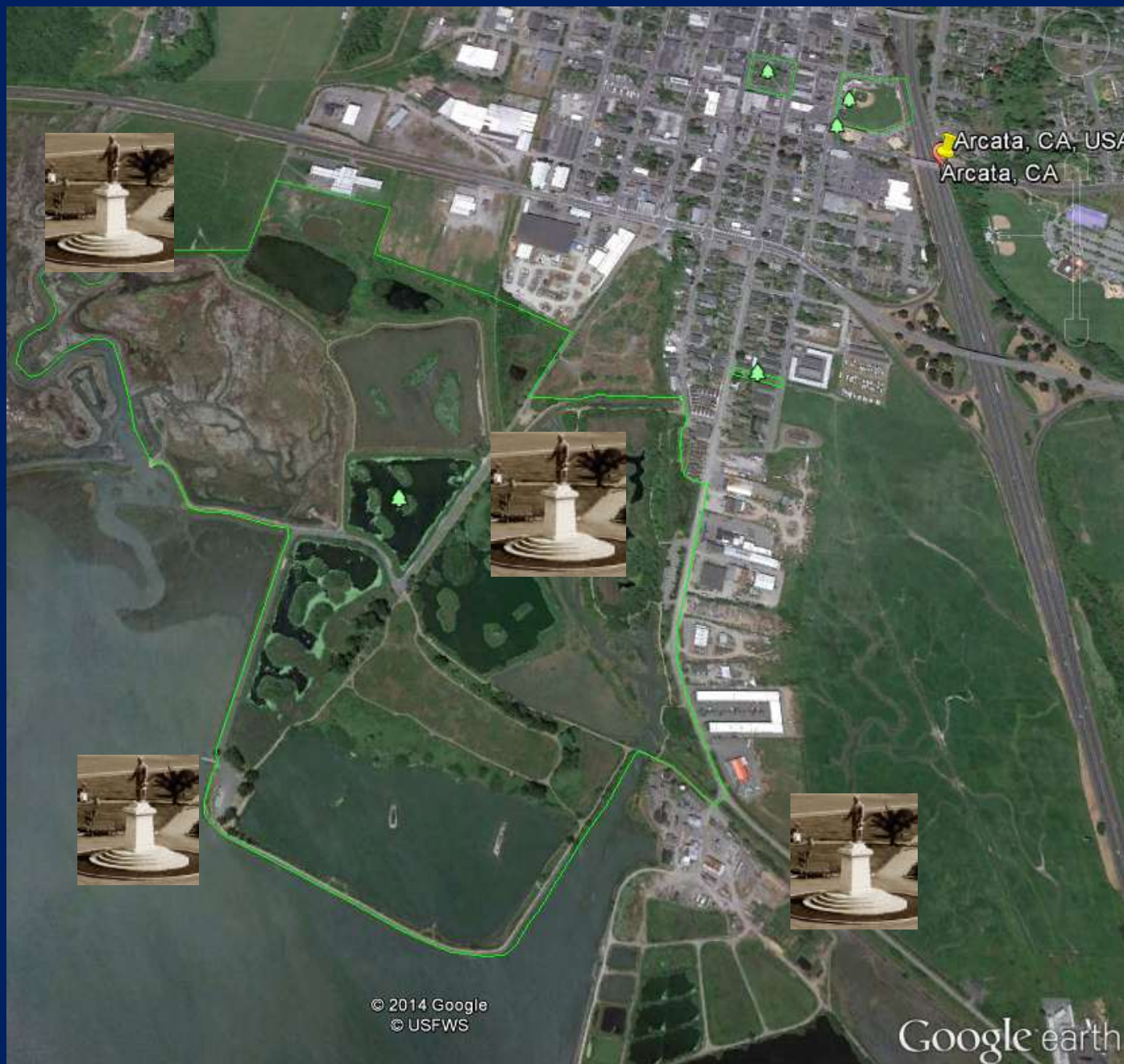
Arcata, Humboldt Co., California
Circa 1913

CV No. 97-060-0001



Arcata
Marsh:
307 acres-

Covered
by 5 m of
sediment



Arcata Marsh:
307 acres-

Covered by
5 m of
sediment

Formation (and persistence) of large log jams







HUNTER CREEK, HUMBOLDT COUNTY, Feb. 14, 1956. Heavy 1955-56 winter rains and resulting December and January floods failed to move this jam which extends about 300 yards downstream and completely blocks the passage of migrating fish. (Fish and Game photo.)



Log jams store sediment, releasing it as the jams decay over time.



Log jam on Van Duzen River, 1964



From Rumney and Stockton, 2014



Orick 1950

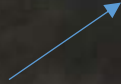
Hwy 101 Bridge built ~1922, survived the 1964 flood
5200 vehicles per day



**Orick
Bridge
replaced**

New Highway 101 bridge

Abutment



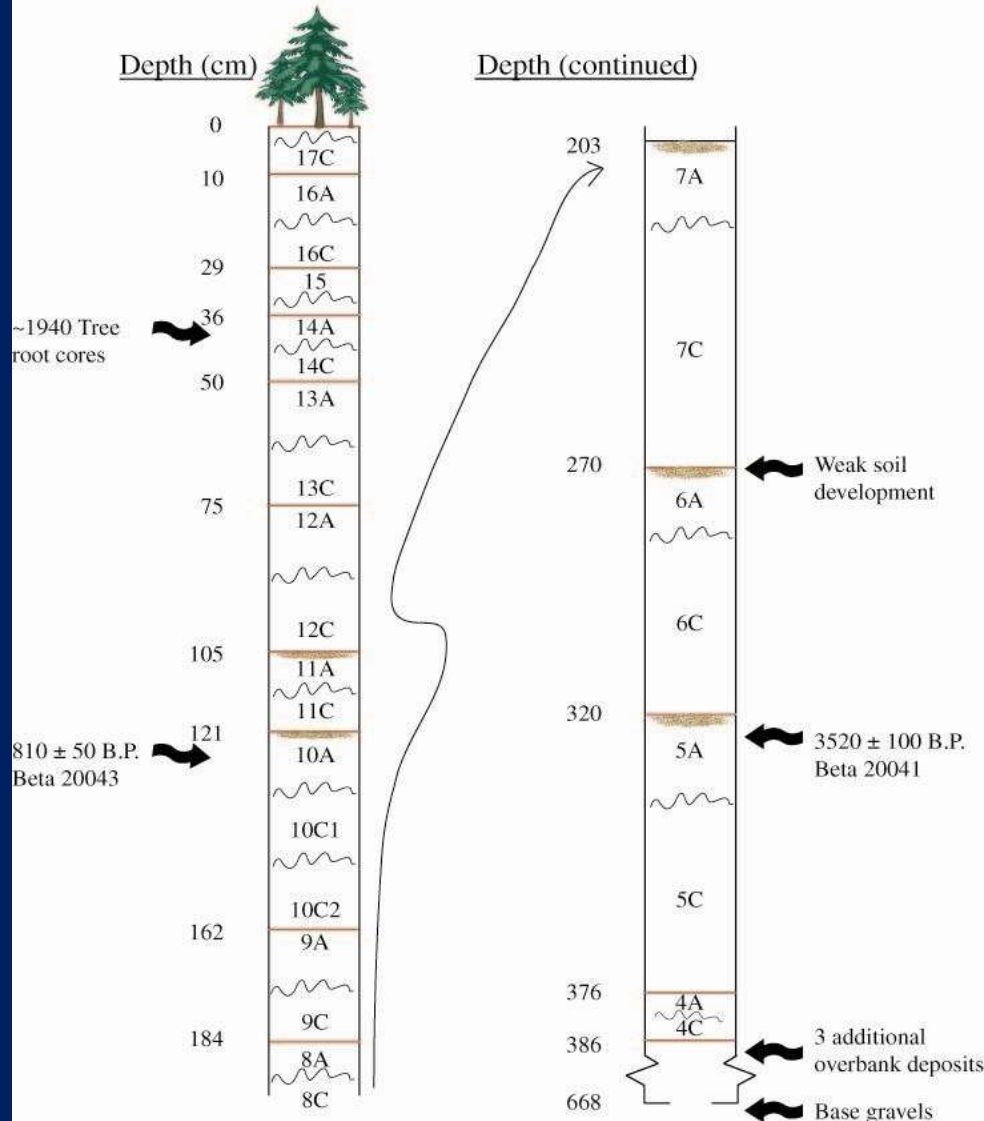
**Overbank
flood deposits**



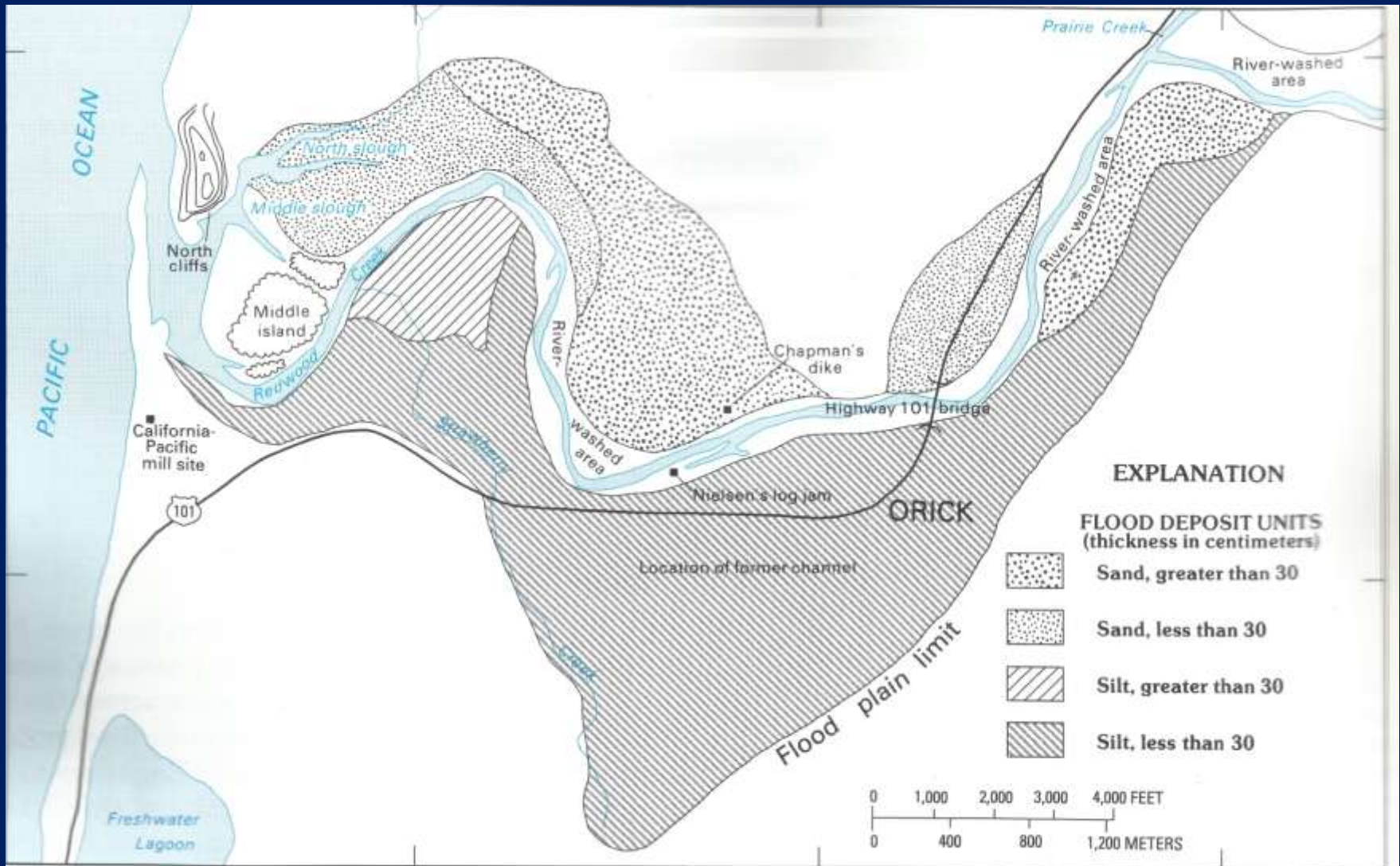
Mapping of flood deposits at Tall Trees Grove

OVERBANK FLOOD DEPOSITS, TALL TREES GROVE

Pit 2-A & Core 4



1964 Flood Deposits: Sand vs. Silt



From Ricks, 1995



**Trees damaged by
gravel deposits**



Sand deposits upstream of Elbow Slide

Near-shore sediment deposition – Preservation of flood events



Several studies of Eel River shelf, none for Redwood Creek

Long-term impacts on Redwood Creek estuary



Date: June 11, 1941 (NPS collection)

Construction of flood control levees in 1968 dramatically changed circulation patterns in estuary



1941

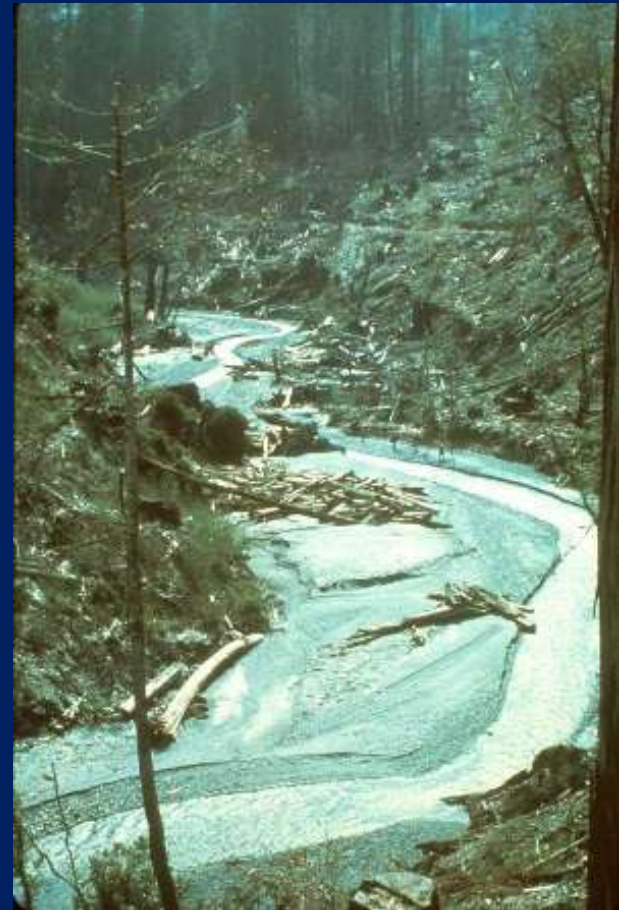


2012



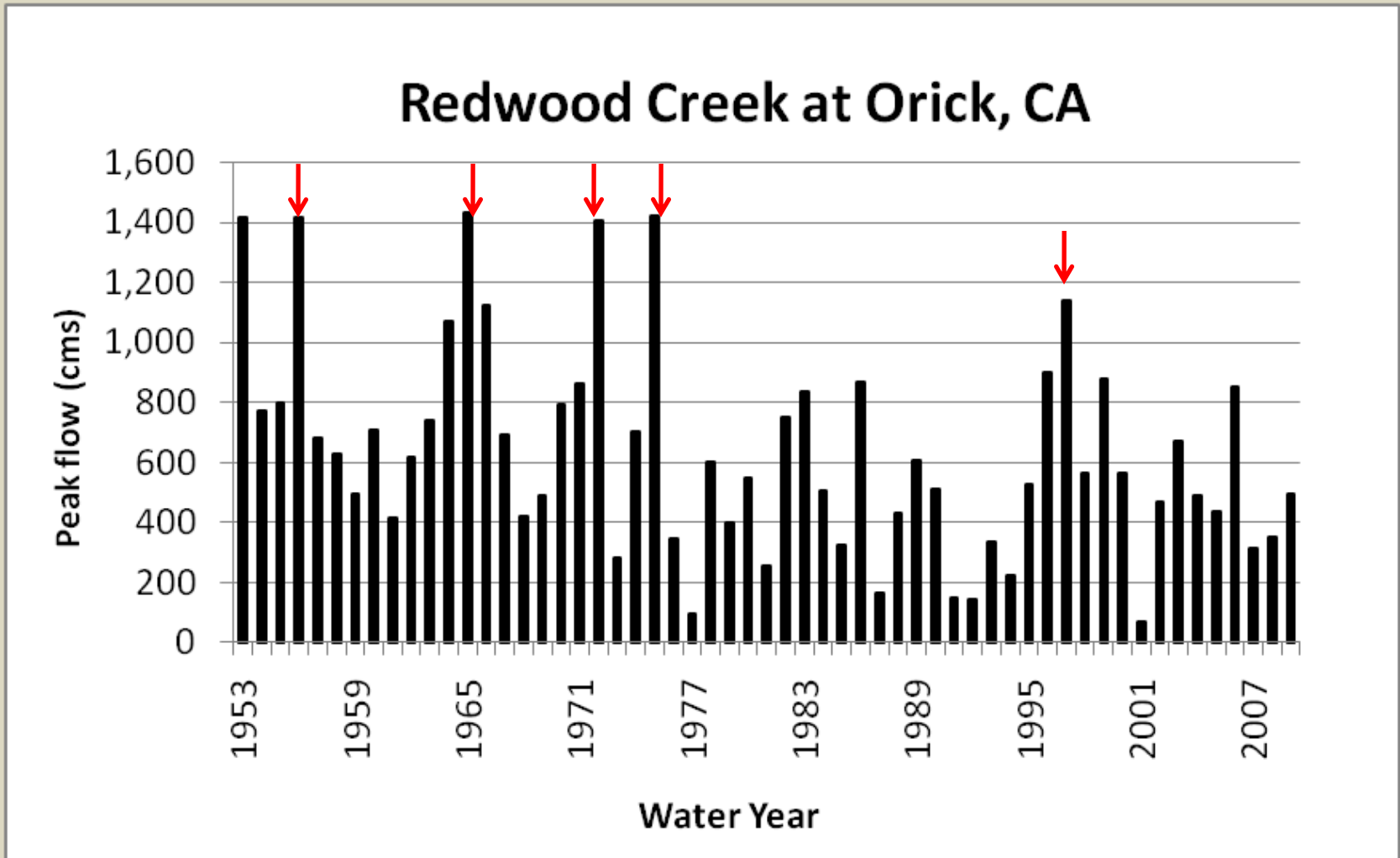
100-year flood inundation map for Orick valley
(Data from USGS, NOAA, USDA, NASA and more)

Increased recognition of impacts of logging helped lead to establishment of REDW in 1968 and California Forest Practice Rules, 1973.



Could a 1964 event happen again?

Peak Flows in Redwood Creek



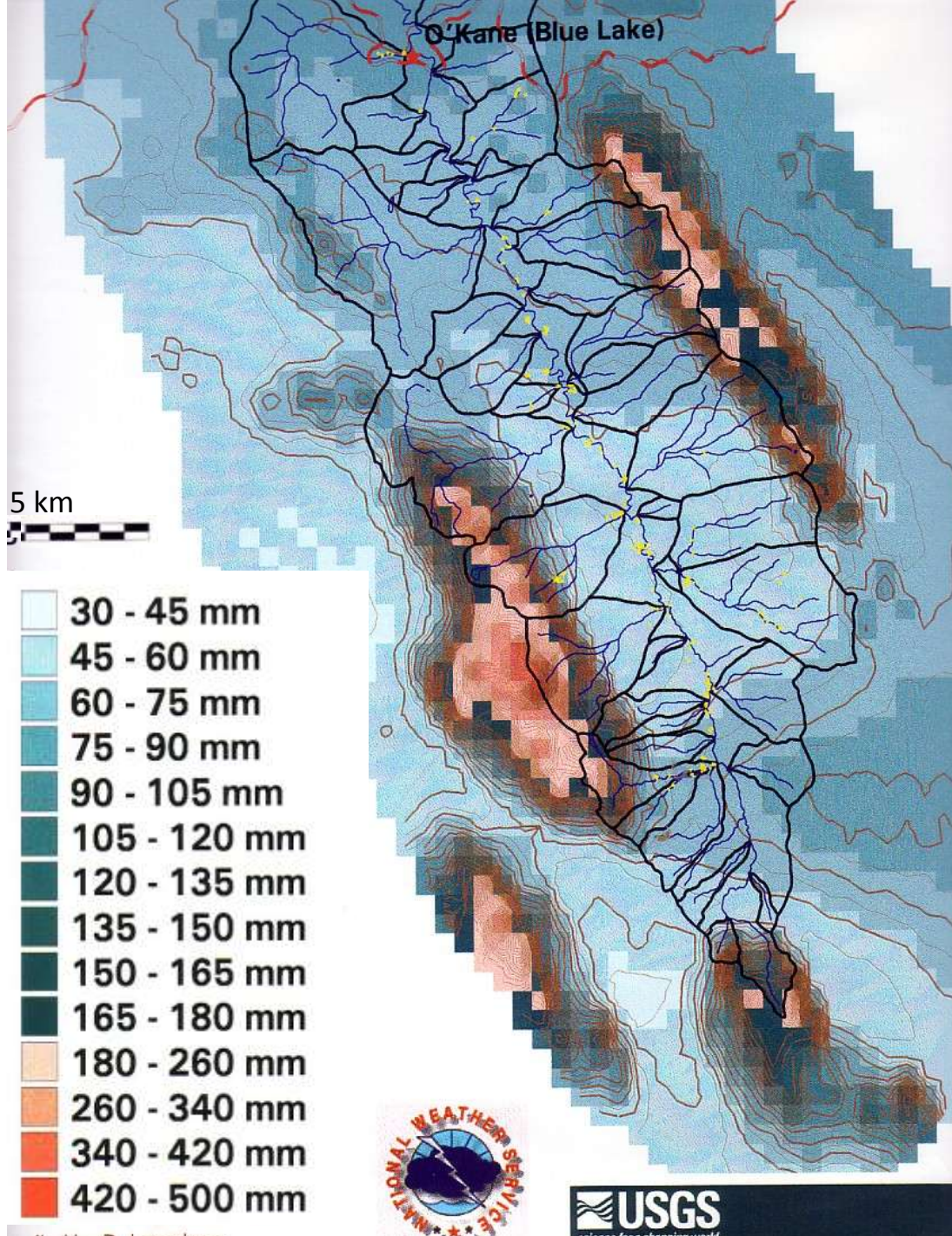
Could a 1964-type flood occur in the near future?

SHALSTAB Model of Slope Stability

Landslide •

High Rainfall Variability:

24-hour rainfall
from Doppler
radar data,
January 1, 1997



Compiled by Dave
Lamphear and National
Weather Service

Source of large wood that could possibly enter channels is largely gone





**Extensive
second-
growth
forest at
present**